Daniel Fulop

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Education

2001-2009 **Harvard University** *Ph.D., Organismic and Evolutionary Biology*
Dissertation: Evolution of floral diversity in *Catasetum* (Orchidaceae) — Integrating phylogeny, biomechanics, and pollination ecology. Advised by Dr. Elena M. Kramer.
Relevant coursework: Topics in Plant Developmental Genetics, Plant Systematics, Seminar in Evolution and Development, Plant Development and Differentiation, Tropical Insect Systematics, Paleobotany, Neutrality, Selection, and Population History.

2002 (summer) **Organization for Tropical Studies**, Costa Rica *Tropical Plant Systematics* field course
This 6-week course focused on field identification of plants in all major Neotropical ecosystems.

1997-1999 **Cornell University** *B.A., Biological Sciences* Concentrations in Biochemistry and in General Biology.
Relevant coursework: Evolution, Macroevolution, Population and Evolutionary Ecology, Modeling Behavioral Evolution, Development and Evolution, Biology of the Neotropics, Analytical Chemistry, Intro. to Computer Prog.

1994-1996 **Universidad Central De Venezuela**, Caracas, Venezuela *Licentiate in Biology* (transferred to Cornell University)
Relevant coursework: Botany, Organic Chemistry, Biochemistry, Genetics, Biostatistics, Principles of Physical Chemistry, Topics in Biological Physical Chemistry.

Research Experience

2010-present **UC Davis** *Postdoctoral Scholar*, Tomato Genomics and Evolution, Maloof Lab, Plant Biology Department
Investigating the evolutionary and statistical genetics and genomics of ecological and developmental traits in domesticated tomato (*Solanum lycopersicum*) and its wild relatives. We are studying the relationship between light quality as perceived by the phytochrome protein family and leaf shape (in relationship to carbon fixation and leaf shape evolution), among other traits such as salinity, drought, and cold tolerance.

2001-2009 **Harvard University** *Doctoral dissertation research*
Investigated the evolution of *Catasetum* orchids by integrating studies of the biomechanics of their pollinarium ejection and redirection and of their molecular phylogenetics.
Techniques used: degenerate primer design for novel gene isolation in non-model taxa; RNA and DNA extraction, and cDNA synthesis; PCR; gene cloning; phylogenetic analyses; comparative phylogenetic methods; biomechanics of fast plant movements; scanning electron microscopy; plant histology.

2000-2001 **MolecularWare, Inc.**, Cambridge, MA *Quality Control Engineer*
Led microarray software testing and quality control, wrote program documentation and manuals, assisted software engineer staff with their grasp of biology, and kept the software team abreast of new developments in the bioinformatics of high-throughput biology research.

1999-2000 **Cornell University** *Research Technician* Dept. of Biological Engineering, Nanoscale Biol. Eng. and Transport Group
Member of Dr. Carlo Montemagno's group. Performed protein biochemistry experiments for the development of an ATPase as a motor for nanoscale machines. Managed the undergraduate research assistants in the laboratory.
Techniques used: protein purification by high pressure liquid chromatography; culture of 10L and 50L bacterial fermentor batches for protein isolation; SDS-PAGE and non-denaturing protein gel chromatography; Western blot analysis; enzyme activity assays for ATPases.

1997 (spring) **Harvard Medical School** *Research Assistant* Beth Israel Hospital, Division of Immunology
Volunteered in the laboratory of Dr. Terry Strom. Assisted in a study of Interleukin-15 and its relation to arthritis. Gained knowledge of basic molecular biology and *E. coli* microbiology.

1994–1995 **Universidad Central De Venezuela** *Research Assist.* Experimental Medicine Inst., Molecular Genetics Lab.
Worked with Dr. J. C. Mendible on a research project characterizing local patients' tuberculosis strains.

Teaching Experience

2008 (spring) **Harvard University** *Teaching Fellow*, Feeding Yourself; Feeding the World.
Taught laboratories and sections, administered and graded homework assignments, and taught exam review sessions. This course focused on personal nutrition and global food issues.

'03, '05, '06 & '07 (spring) **Harvard University** *Teaching Fellow*, Biology of Plants
Taught laboratory, for which I developed homework assignments and short tests, as well as presentations to complement lectures. I also taught the lecture on Monocots.

2006 (fall) **Harvard University** *Teaching Fellow*, Plant Development and Differentiation
Taught exam review sessions.

2002 (spring) **Harvard University** *Teaching Fellow*, Genetics and Genomics

Taught laboratory and discussion sections, administered and graded short tests and writting assignments, and taught exam review sessions.

1996 (fall) **Universidad Central De Venezuela (UCV)** *Teaching Assistant*, Principles of Physical Chemistry
Taught one of four sections, developed homework assignments and short tests, taught exam review sessions for the entire class, and assisted in exam grading.

Honors and Grants

American Orchid Society Research Grant (fall 2005 — fall 2008) for the project: Integrating phylogeny, biomechanics, and pollination ecology in a study of the genus *Catasetum*. The amount of this award is equivalent to an NSF-DDIG grant, and funded most of my doctoral research.

2005 J. S. Karling Graduate Student Research Award from the Botanical Society of America for the project: Integrating phylogeny, biomechanics, and pollination ecology in a study of the genus *Catasetum*.

Organization for Tropical Studies post-course field research grant to collect *Catasetum maculatum* male and female flower buds of different developmental stages, as well as voucher and silica-dried specimens in Costa Rica (August 2002).

London International Youth Science Forum (summer 1996), selected by the British Council in Venezuela as the sole representative for the country in this science conference.

Award for Student Merit (1995) for the highest GPA in the School of Biology of the Universidad Central de Venezuela (out of 400 undergraduate students).

Publications

R. E. Kerwin, J. M. Jimenez-Gomez, **D. Fulop**, S. L. Harmer, J. N. Maloof and D. J. Kliebenstein. Network Quantitative Trait Loci Mapping of Circadian Clock Outputs Identifies Metabolic Pathway-to-Clock Linkages in *Arabidopsis*. Plant Cell, 23 (2): 471-485

Manuscript in preparation **Fulop, D.**, J. Dumais, and E.M. Kramer. Pollinarium ejection and the evolution of hypervariable male flowers in *Catasetum* orchids.

This work was covered in Science News and NPR's Science Friday:
www.sciencenews.org/view/generic/id/46006/title/Bent_innards_give_orchid_its_kick
www.sciencefriday.com/videos/watch/10370

Manuscript in preparation **Fulop, D.**, G.A. Romero, C. van den Berg, W. Moss, B. Sharma, and E.M. Kramer. Phylogenetics of *Catasetum* and the Catasetinae (Orchidaceae).

Presentations and Posters

Invited Speaker **Fulop, D.**, Dumais, J., and E.M. Kramer. Pollinarium ejection and the evolution of hypervariable male flowers in *Catasetum* orchids. Botanical Society of America Conference 2009, Snowbird, Utah, July 25th to 29th. This talk was part of the symposium on *The Power of Movement in Plants*.

Invited Speaker **Fulop, D**. How bees get whacked: Biomechanics of pollinarium expulsion in *Catasetum*. First Scientific Conference on Andean Orchids, November 11-13 2005, Gualaceo, Ecuador. This conference was attended by leading orchidologists from Europe and the Americas representing all major Neotropical orchid groups.

Poster **Fulop, D.**, E.M. Kramer. Phylogenetics and Development of *Catasetum* L.C. RICH (Orchidaceae). Botanical Society of America Conference, 31 July – 5 August 2004, Snowbird, Utah.

Poster **Fulop, D.**, E.M. Kramer. Evolution of flower sexual dimorphism in *Catasetum* L.C. RICH (Orchidaceae). Monocots III, Third International Conference on the Comparative Biology of Monocotyledons, 31 March – 4 April 2003, Rancho Santa Ana Botanic Garden, California.

Presentation **Fulop, D.** Evolution of flower sexual dimorphism in *Catasetum* L.C. RICH (Orchidaceae). Evolution and Development Seminar Series, February 2003, Harvard University, Cambridge, Massachusetts.

Poster **Fulop, D.** Evolution of flower sexual dimorphism in *Catasetum* L.C. RICH (Orchidaceae). Molecular Genetics and Ecology of Plant Adaptation Conference, December 11 – 13 2002, University of British Columbia, Vancouver.

Public Outreach and Education

Smithsonian Natural History Museum. Provided high-speed pollinarium expulsion videos and many other visual materials of *Catasetum* for the exhibition *Orchids through Darwin's Eyes*, that ran in the spring of 2009 from January 24th until April 26th. **URL:** http://www.mnh.si.edu/exhibits/orchids/

Aventura City of Excellence School, Aventura, FL. *Presentation, Invited Speaker*. November 8th, 2007. Presented a joint lecture to 6th and 8th grade students on orchid evolution and the biomechanics of *Catasetum* orchid pollinarium expulsion.

Museum of Science, Boston. *Presentation, Invited Speaker.* How bees get whacked: Biomechanics of pollinarium expulsion in *Catasetum*. April 15th, 2007. I was one of two speakers leading an orchid workshop that was organized as part of the activities surrounding the American Museum of Natural History's traveling Darwin exhibit.

Smithsonian Networks. Provided high-speed pollinarium expulsion videos and flower photos of 16 *Catasetum* species to Networks, a cable channel jointly founded by Showtime and the Smithsonian Institution (spring 2007).

Massachusetts Orchid Society. *Presentation, Invited Speaker.* How bees get whacked: Biomechanics of pollinarium expulsion in *Catasetum*. January 2006 society meeting.